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ABSTRACT

This analytical report on higher education in Egypt argues that Egypt's policy must take account of the realities of declining government budgets and employment and the need to rely increasingly on the private sector, which must become more competitive internationally. Previous policy, which expanded higher education rapidly (despite a persistently high rate of illiteracy) and guaranteed jobs to university graduates, resulted in over-enrollment and poor educational quality. Currently, the government's strategy is to stabilize the number of university students and raise the quality of instruction, expand the role of two- and four-year technical institutes, increase the use of pedagogical materials in instruction, and promote innovative interdisciplinary programs that stress problem solving and applied work. Following an executive summary, the report is put in context by reviewing Egypt's development strategy in the 1990s. The following sections cover the history of higher education in Egypt; and higher education performance and the determinants of performance (including quantity, quality, internal and external efficiency, and equity). A concluding section examines current responses and reforms of the government, employers, students, and universities. A statistical annex provides data tables. (Contains 18 references.) (DB)

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Education and Employment

Population and Human Resources
Department
The World Bank
February 1992
WPS 862

Higher Education in Egypt

Alan Richards

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Education in Egypt must increase people's ability to respond quickly and effectively to changing technological and market opportunities. Egypt is therefore stabilizing university enrollment, boosting non-university technical institutes, and promoting interdisciplinary programs that stress problem-solving and applied work.

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Policy Research

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This paper — a product of the Education and Employment Division, Population and Human Resources Department — is part of a larger effort in the department to build a knowledge base on higher education issues and reforms. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Jegajothy Vythilingam, room S6-220, extension 33677 (40 pages). February 1992.

Egypt's policy on higher education, Richards argues, must take account of the realities of declining government budgets and employment and increasing reliance on the private sector, which must become more competitive internationally. Education in Egypt must increase Egyptians' ability to cope with economic disequilibria: to respond quickly and effectively to changing technological and market opportunities.

The Government of Egypt's strategy for achieving this goal is to stabilize the number of university students and raise the quality of instruction. This fundamentally sound strategy, pursued since the mid-1980s, has required considerable courage of policymakers.

Policymakers are struggling to correct a longtime, inequitable misallocation of educational resources — including an overenrolled university system combined with a persistently high rate of illiteracy.

The Nasser regime greatly expanded higher education and guaranteed jobs to university graduates. As a result of rapidly growing enrollment in the 1970s and 1980s, the quality of education deteriorated seriously. Classes are too big and resources are scarce for anything but professorial salaries (which remain low), so learning amounts to little more than memorization and repetition. The system does not foster the development of synthesizing, problem-solving, or creative thinking abilities. And with tertiary institutions overenrolled, academic success requires the use of tutors, whose fees are beyond the reach of students of modest means.

The Government is trying to improve conditions by stabilizing university enrollments, expanding the role of two- and four-year technical institutes, increasing the use of pedagogical materials in university instruction, and promoting several innovative interdisciplinary programs that stress problem-solving and applied work.

The job guarantee has effectively been suspended since the early 1980s, but students have responded slowly to changing signals from the labor market, because being a university graduate is socially prestigious and presumed to increase one's chances of marrying well.

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EXECUTIVE SUMMARY

THE CONTEXT: EGYPT'S DEVELOPMENT STRATEGY FOR THE 1990s

1. The role and development of Egypt's higher education system are placed in the context of the country's current economic development problems and strategy. Historical background to the problems and development of the higher education system is provided. The principal quantitative and qualitative developments of higher education are then presented; internal and external efficiency and equity of the current system are briefly analyzed. The report concludes with a review of the principal responses to these problems by government, employers, students, and universities.

2. The main macro-imbalances and micro-distortions of the Egyptian economy are briefly outlined, with particular reference to the labor market. Because of the "twin gaps" (between domestic savings and investment, and between imports and exports), Egypt has accumulated a very large foreign debt. Investment has been biased towards non-traded goods, and had a strong capital-intensity bias. Consequently, the country is ill-equipped to take advantage of its comparative advantage, and job creation has been seriously retarded. Since the labor force growth rate is now 2.7% per year and is accelerating, this is an especially serious problem. Employment creation and the production of tradeables are further retarded by high inflation, in turn largely caused by the very large government deficits (typically around 20% of GDP). Egypt in the 1990s faces a period of severe structural adjustment.

3. The main consequences for the labor market and for higher education are: 1) government spending must fall; this increases the urgency of more efficient allocation of resources within the educational system; 2) government, one of the main sources of job creation between 1973 and 1985, can no longer play this role; 3) the country must embark on a strategy of manufactured export-led growth to solve the problems of trade and employment which implies: 4) a greater role for the private sector, and 5) the development of "the ability to deal with disequilibria", or raising the quality of human capital, specifically, by increasing problem-solving ability.

4. The fundamental strategy for higher education which can complement the wider development strategy is to reduce the quantities of university students in order to raise the quality of instruction: "better fewer, but better". Policy makers have been implementing such a strategy since the mid-1980s, taking initiatives which have required considerable courage.

HISTORY OF HIGHER EDUCATION

5. Many of Egypt's educational problems have deep historical roots. In common with most "plantation societies", the ancien regime (c.1840-1952) did little to foster the development of human capital. British indirect rule, budgetary stringency, and demand for obedient civil servants did little to improve matters. Criticisms voiced over fifty years ago (e.g., of students' tendency simply to memorize and regurgitate information) have a curiously modern ring. The first universities were raised on a very narrow social base, and the social demand for education as a path to government employment had already been well established by mid-century.

6. The fundamental institutions and problems of the higher education system were created by the government of Gamal Abd-el-Nasser (1952-1970). The educational system as a whole expanded rapidly, with growth in secondary and university enrollments being especially rapid. Higher education was offered free of charge, and in 1964 the government guaranteed a government job to any university graduate. A very large wedge was thus driven between the private and social returns to higher education. The explosion of secondary school enrollments in the 1960s set the stage for extremely rapid increase in university enrollments in the 1970s. The latter increased nearly 3.5 times between 1971 and 1984, with most of the growth occurring in the 1970s.

7. The percentage of science students steadily declined even as enrollments soared: the universities turned out ever-larger number of graduates with poor job prospects. The government partially concealed this problem by rapidly inflating the number of persons in the bureaucracy and (until 1980) in public sector enterprises. By 1982/83 government employment was three times higher than it was at the height of Nasser's "Arab Socialism", 1966.

8. The flood of students into the universities in the 1970s and early 1980s led to a serious deterioration in the quality of instruction. The problem was compounded by large scale emigration of professors to the capital-surplus oil exporting nations, which offered salaries as much as fifteen times higher than those in Egypt.

9. Beginning in the early 1980s, the government of Egypt began to respond to these problems. It suspended de facto the job guarantee; it began to limit enrollment in universities; it raised faculty salaries and tried to foster greater reliance on problem-solving abilities. However, serious budget constraints have hampered achieving objectives.

III. PERFORMANCE AND ITS DETERMINANTS

10. The quantitative development of the higher education system may be summarized as follows: 1) university enrollments grew at over 14% per year between 1971 and 1977; 2) growth

decelerated during 1977-84 to 5.4% per year, 3) after 1984 enrollments declined, falling from a peak of nearly 650,000 to 567,000 in 1989; 4) most enrollment growth was in the humanities: the share of sciences students fell from 55% in 1971 to just over 25% in 1989; 5) the government has attempted to channel the ever-increasing numbers of successful secondary school leavers into two year technical schools. Founded in 1973, their enrollments now stand at over 100,000.

11. Real resources for higher education grew steadily throughout the 1980s. The share of higher education spending in total educational spending has also risen. Unfortunately, however, these increases have been entirely absorbed by raising faculty salaries. Although this was necessary, it has left very little money available for libraries, labs, and other materials, which are necessary if university education is to break out of its "memorize-and-regurgitate" mode.

12. This mode is the main quality problem in higher education. The causes of this problem include the legacy of the kuttab (Quranic schools), the high student/faculty ratios at all levels of the educational system, the absence of materials, the training system for teachers, and the fact that few problem-solving skills are required in the government bureaucracy.

13. Although university administrators are valiantly attempting to remedy this situation, they face an up-hill struggle in a structural adjustment context. Further, the MOHE has no discretion over the allocation of spending between faculty salaries and other categories of spending, since it receives "line item" budgets from the Ministry of Finance. The competence of the latter Ministry to make educational decisions is very dubious.

14. The system suffers from serious external inefficiencies. The government job guarantee and the anti-employment policy matrix of the last twenty years has seriously impeded the creation of non-public sector employment. Yet the continued absorption of graduates into the bureaucracy has become unsustainable; the wage bill constitutes about one-third of all government current expenditure. The total wage bill has been reduced by cutting public sector wages and by ceasing to hire new personnel. This has reduced the private return to higher education, further eroded administrative effectiveness, and forced much of the adjustment onto new labor market entrants, especially the young and educated. The share of the latter in total, measured unemployment has increased dramatically over the past several decades.

15. The responsiveness of prospective university students to these changing market signals has, however, been reduced by several factors. First, the government remains de jure responsible for employing graduates, despite the de facto suspension of the job guarantee. This has led to some dubious employment schemes, such as allocating reclaimed land to (non-agricultural) university graduates, which continue to signal young people and their families that "the government will provide". Second, in Egypt as elsewhere, the demand for higher education shifts counter-cyclically: as job prospects worsen throughout the economy, the opportunity cost of attending university declines. Third, holding a university degree confers high social status, and is especially important in

the "marriage market". This latter force may be changing very slowly among some classes of society, and it is hoped that the strong demand for skilled labor will further erode the "effendi syndrome", the desire of all to shun manual labor.

16. The fundamental equity problem of higher education is that too many resources are allocated to his sub-sector at the expense of primary education. Since the percentage of secondary school enrollments is lower among rural youth, such implicit subsidies also have an "urban bias". Some progress has been made in increasing the proportion of young women in the universities.

17. The educational system is further biased against the poor through the system of "tutorials", in which private tutors greatly improve the chances of obtaining a high mark on the General Secondary Exam, and therefore, of entering the university, particularly its more prestigious faculties such as medicine. In common with many countries, the higher education system in Egypt reproduces existing social inequalities.

18. In light of the above, many have suggested charging "users' fees" or tuition for universities and/or the creation of private universities (there is one such university in the country at present). These proposals have so far been blocked by middle-class interests, and by a fear of political back-lash. It is also impeded by the unflattering popular perception of governmental competence: many fear that scholarships, which would be necessary to ensure access to education for the poor-but-talented, would in fact be allocated to those with "connections".

19. In summary, the supply of quality higher education is sharply constrained by large class sizes, low faculty salaries which encourage absenteeism and moon-lighting, and the inadequacy of extra-classroom materials. The demand for higher education remains very strong despite the declining remuneration of public employees and the very long queues for government jobs because of the absence of fees, the continued de jure job guarantee, the depressed state of the labor market, and the continuing high social prestige of a university degree.

IV CONCLUSION: POLICIES AND RESPONSES

20. Government responses include: reducing the growth of the universities by raising the scores required to pass the GSE, increasing budgetary allocations to higher education, and suspending the job guarantee. De jure suspension of the latter would further reduce the wedge between the social and the perceived private return to higher education. Policy has done little to increase the equity of the system; proposals to "target" higher education would, if effective, have this effect. The fundamental deficiency of government policy toward higher education is the absence of adequate reform of those macro and microeconomic policies which continue to retard job creation in the private sector, especially the traded goods sectors.

21. Private employers have few formal linkages with the universities. Although the private university does sponsor "job fairs", the public universities have yet to follow, perhaps because the Ministry of Labor technically retains a monopoly on all job placements. Informal private sector employers, of course, rely on word-of-mouth and family networks for recruitment. Although many university graduates are employed in this sector, this is usually because they lack any viable alternative.

22. Students have responded slowly to the changing labor market signals. There is little evidence that the demand for higher education has slackened appreciably.

23. In addition to attempts to raise faculty salaries, universities have created some innovative interdisciplinary programs which seeks to foster the kind of practical, problem solving skills which Egypt will need if the economic strategy of manufactured export-led growth is to be successful during the coming decade.

I. THE CONTEXT: EGYPT'S DEVELOPMENT STRATEGY FOR THE 1990s*

1. The role and development of Egypt's higher education system must be placed in the context of the country's current economic development problems and the strategy which the government is implementing to confront these difficulties. Accordingly, this report begins with a brief overview of problems and strategies, with a special focus on the labor market. The second section provides historical background to the development and current problems of the higher education system. The principal quantitative and qualitative developments of higher education are then presented; internal and external efficiency and equity of the current system are briefly analyzed. The paper concludes with a review of the principal responses to the problems by government, employers, students, and universities.

2. The Egyptian economy is characterized by serious macro-imbalances and micro-distortions. These have not only generated a large foreign debt, but have also seriously impeded the rate of growth of the demand for labor. This, in turn, has driven down real wages and increased unemployment. Both have contributed to a probable increase in poverty since the mid-1980s; unemployment is increasingly concentrated among young people with education, including university graduates. The employment problem is particularly severe since the labor force is growing by 2.7% per year.[1] Given Egypt's resource endowment, a development strategy which focuses on labor-intensive manufactured exports has the best chance of remedying this serious situation. One should ask how the higher education system can the system provide the kind of human capital which such a strategy will require.

3. The core of Egypt's macroeconomic problems is the "twin gaps" between investment and domestic savings, and imports and exports. These difficulties are compounded by a third gap, that between government spending and revenue. The savings/investment gap grew throughout the 1980s, reaching 12% of GDP in 1986/87. Savings, in particular, have collapsed: public sector savings declined and oil revenues dwindled, and public sector companies, enjoined to hire and forbidden to fire for roughly two decades, accumulated losses, which in the late 1980s were about 8% of GDP. Recorded private sector savings available to the economy were and are reduced by negative real interest rates on Egyptian pound deposits.

4. Despite the high investment ratio, most investment went into (admittedly badly deteriorated) infrastructure, rather than traded goods production which received perhaps 45% of investment from 1982-87. The relative neglect of investment in traded goods, especially manufacturing (which received less than 20% of all investment) did little to foster exports and to create jobs. More seriously still, investment had a strong capital-intensity bias: ICOR (incremental

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* I would like to thank Jamil Salmi for his helpful comments on an earlier draft.

[1] Unless otherwise stated, all numbers in this section are official Central Bank statistics.

capital to output ratio) rose from about 2.5 in FY 1976-81 to 6.5 in FY 1984-88, while the capital-to-labor ratio rose at just under 15% per year from 1975 to 1985 (Handoussa, 1991). A country with a rapidly growing labor force and increasingly scarce capital increasingly utilized the scarce factor at the expense of the abundant one. The seriously deleterious employment consequences of such developments are considered below (paragraphs 1.12-1.13).

5. The weaknesses in the volume and pattern of investment contributed to the second gap, that of the balance of trade. Imports were roughly 2.5 to 3 times larger than commodity experts throughout the 1980s. The recent decline in the trade gap has been entirely due to the compression of imports rather than to any significant improvement in export performance. Since roughly two-thirds of Egyptian imports are intermediate and capital goods, the current level of imports is unsustainably low: export performance must improve.

6. Export developments during the 1980s were dominated by the decline in the value of petroleum sales, which fell from $2.9 billion in 1983 to $1.36 billion in 1987. The share of oil in total exports fell from 70% in 1983 to just under 50% in 1987. Other traded goods failed to take up the slack created by the decline of oil. Although Egypt experienced the usual problems of the Dutch Disease during the oil boom, the end of the boom brought no relief. Agricultural exports continued to deteriorate, with cotton export volume in 1990 only about one-third that of the early 1980s. In 1987 the agricultural trade deficit stood at about $2.8 billion, or roughly one-third of the total trade deficit. Industrial exports fared only slightly better. Textiles and related products account for some 60% of such exports; these and other expanding industrial exports (e.g., aluminum) enjoy substantial subsidies.

7. Invisible earnings fared better. Tourism grossed over $2 billion per year on the eve of the Gulf Crisis, and provided the only really bright area of the Egyptian economy in the late 1980s. Workers' remittances out-performed most predictions in the late 1980s; however, the violent repatriation of Egyptians from Iraq, the country with the largest number of Egyptians working abroad, in the fall of 1989 was a harbinger of the future. In December, 1990, the GOE estimated that some 400,000 Egyptians had returned from the Kuwait and Iraq in the wake of the Gulf Crisis. Such returnees increase the already considerable burden of job creation, and, of course, could no longer contribute their remittances to domestic savings.

8. In the final analysis, Egypt plugged its twin gaps by borrowing from abroad. On the eve of the Gulf Crisis, the total debt was roughly $50 billion; the debt to GDP ratio, if valued at the free market exchange rate, was 150%, the highest ratio in the world. Despite debt relief inspired by the Gulf Crisis, if the underlying problems of the twin gaps are not solved, the debt will simply start to grow again--assuming willing creditors can still be found. A strategy must be found to increase exports, increase domestic savings, and channel investment into traded goods sectors.

9. The twin gaps have been exacerbated by a third gap, the government deficit. Although the size of the deficit has been reduced, it remained unsustainably high at 16-17% of GDP in 1988/89.[2] At least 40% of the deficit is financed by the banking system; the deficit is therefore a major source of inflation, now conservatively estimated at 25% per year. Inflation, of course, heightens uncertainty, further distorts price signals, engenders negative real interest rates, and complicates management of the foreign exchange rate.

10. A few details of some aspects of how the GOE has tried to cut the budgetary deficit are relevant to the situation of the higher education sub-sector. First, because of the inelasticity of revenues with respect to incomes and their heavy reliance on oil, most adjustment has fallen on spending. Most of latter, in turn, is composed of subsidies, public sector salaries, interest on the public debt, and the military. The first two have been protected, forcing most adjustment onto subsidies and public sector salaries. Rather than reduce the government wage bill through lay-offs, the GOE has chosen to reduce real spending on public sector salaries by freezing nominal wages and new hires. (Such policies also reduce employment through attrition and retirement). Real wages in the public sector fell to 55% of their 1973 level by 1989. Two consequences follow: 1) adjustment costs are concentrated on new entrants to the job market (including those matriculating from institutions of higher education) and 2) the decline in government salaries has reduced the relative economic attractiveness of such employment.

11. Micro-economic distortions reinforce these macro-imbalances. Egyptian prices bear little relation to scarcities, and price distortions react synergistically with the regulatory environment to create a producers' nightmare. For the higher education sub-sector, the most significant example of this baleful interaction is the increasing capital intensity of production. Partly this phenomenon has been caused by price distortions: the relative price of labor to capital rose as labor emigration pushed up wages while accelerating inflation and financial regulations engendered strongly negative real interest rates. Regulations exacerbate the problem: Individual lay-offs must be reviewed by a tri-partite (management, labor, government) committee, whose ruling is advisory. However, an employee has appeal rights, and for group lay-offs, the committee's ruling is binding (World Bank, 1990b). Legally the government has a monopoly on all job placements outside of agriculture and the informal sector. It follows that all hiring for the kind of well-paying jobs with a future which most university graduates seek (e.g., in the private formal sector), must be done through the government. In practice, private companies can and do hire either through "head-hunting" agencies or through informal networks of personnel managers. Nevertheless, these cumbersome and inefficient regulations reduce the flexibility of the labor market by converting labor, the "variable cost" example of every elementary economics textbook, into overhead. As Hansen has pointed out, such a complex of forces has created the paradoxical situation of Egyptian producers using too much capital and labor (Hansen, 1991).

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[2] In fiscal 1989/90, the government claimed that the deficit had fallen to 7% of GDP; however, in 1990/91, it returned to former levels of some 17%.

12. Policies which retard the level and rate of growth of demand for labor have extremely serious consequences in a country with significant un- and underemployment and a rapidly growing labor force. Regardless of future developments with respect to Egypt's external debt, the 1990s are likely to be dominated by the problem of job creation. Because of a "mini-baby boom" in the aftermath of the October War of 1973, the growth of the labor force in Egypt will actually accelerate during the coming decade. Simply providing jobs for new labor market entrants will require the creation of an additional 4.5 million jobs in the 1990s. (ILO, 1991). If current unemployment rates (perhaps 10-15%) are to be reduced, if women's labor force participation is to rise above its current low level (12% in 1986), and if (as is now happening), political events force large numbers of Egyptians working abroad to return, then the number of new jobs needed could be nearly 9 million. Given that the current labor force is about 14-15 million, this is an almost unbelievably daunting task.

13. The picture is not brightened when one realizes that as much as 90% of all jobs created from 1976 to 1986 came from emigration and the expansion of government employment (Handoussa, 1988). [3] Given budgetary deficits and regional developments, neither of these sources can continue to expand at anything like the previous rate. For various reasons, the agricultural sector is most unlikely to create many new jobs in the coming decade (Richards, 1991). Accordingly, only a strategy of manufactured export-led growth has a chance of solving the employment problem in Egypt. Such a strategy will require an expanded role for the private sector, simply because of the latter's greater flexibility in responding to rapidly changing international market conditions. Developments in the higher education sub-sector should be judged on the basis of how well they contribute to the development of such a strategy.

14. A strategy of labor-intensive, manufactured exports, with a greater role for the private sector can both reduce the twin gaps and simultaneously create many jobs. To summarize the argument of this introduction, such a strategy makes sense both because of Egypt's resource endowment, and because of the origins of the current problems. The latter are, as sketched above, the result of macroimbalances and microdistortions. These, in turn, have been generated by the previous strategy of state-led, import-substituting industrialization. This cannot meet the challenge of jobs and growth in the 1990s. Egypt must increase savings, reduce consumption, increase, exports, and raise efficiency, while maintaining a minimal "social safety net" to preserve domestic peace and stability. The economy must become more dynamic and competitive; such considerations, together with Egypt's relative paucity of natural resources and abundant labor, strongly suggest a strategy of private-sector led manufactured export growth.

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[3] The precise percentage is highly sensitive to the (widely varying) estimate of migration. For domestic job creation alone, the public sector generated some 1,235,000 jobs or 55.8%. If we assume that net emigration from 1976 was 1.25 million, then the public-sector-plus-migration share of job creation between the two census years was about 70%--still the large majority of new jobs.

15. Implementing such a strategy requires policy reforms, which, in turn, have implications for human capital formation in general and for the higher education sub-sector in particular. The essentials of the needed "reform package" are well-known: cut the budget deficit by reducing government employment, targeting consumer subsidies, eliminating energy subsidies and all producer subsidies. This would lower inflation, thereby raising real interest rates (nominal rates should also rise) and lessen the difficulties of maintaining a realistic exchange rate. The exchange rate should be unified, so that all remaining subsidies are explicit. Competition must increase by unifying and lowering tariff rates and reducing quantity restrictions. Micro-distortions should be eliminated as quickly as possible, and the regulatory environment must be radically reformed to promote the growth of private manufacturing. [4]

16. The human capital implications of the new strategy and the reforms needed to implement it may be sketched here. Above all, the basic health and education of the mass of the population need to be extended and strengthened. Egyptian policy makers of the 1980s have important achievements to their credit in this area. For example, infant mortality rates declined from 120 per 1000 live births in 1980 to 83 in 1989; primary school enrollment rates rose from 89% for boys and 63% for girls in 1980 to 100% and 79%, respectively, in 1986-88. However, such gains are threatened by increasingly tight budgets and continued misallocation of educational resources, in which higher levels of education receive more funds than lower levels, despite the higher social rate of return to primary education.

17. Such quantitative improvements, while laudable, conceal a continuing problem of poor educational quality. An export-led growth strategy requires flexibility, creativity, and an analytical cast of mind. In the modern, highly competitive international economy, the "ability to deal with disequilibria" identified by T.W. Schultz (1971) as the main economic contribution of education, becomes more important than ever. Far too often, such skills and mental attitudes are <u>not</u> being developed by the Egyptian educational system, most specifically including the universities. In a period of increasing governmental budgetary austerity, additional resources must be found for basic and prepatory education; at the same time, truly analytical thinking must be stimulated at all levels of the educational system: the "ability to deal with disequilibria" <u>must</u> rise if the "export-led growth" strategy is to succeed.

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[4] As of this writing (May, 1991) the government has neared agreement with the IMF on a package of reforms which include some of these measures. Specifically, the exchange rate has been devalued, steps toward unification of the exchange rate have been taken, a value-added tax is promised, and energy prices are to rise gradually to world market levels. These are hopeful, albeit long overdue, changes. Since "reforms" and "agreements" have been announced so often in the past, it remains to be seen whether the changes are genuine, or rather, as in 1987, were simply a means to achieve debt relief from the Paris Club.

18. The implications of the new strategy for higher education policy are clear: "fewer, but better". The country already suffers from an excess supply of ill-trained university degree holders; at the same, technicians and university graduates who are thoroughly trained in analysis and synthesis (as opposed to rote-memorization) are very scarce. The direction of higher education policy is clear: reduce the quantity of university students and graduates, redirecting those denied admission to technical institutes, and simultaneously to upgrade the quality of education of those who remain in the universities. This is now explicit government policy, and is entirely sound. Of course, it faces some difficult constraints, which are discussed in some detail below. Reform in the higher education sub-sector, as in most areas of the Egyptian economy, has been slow; however, the pace of change in this sub-sector has arguably been more rapid than in areas such as macroeconomic and industrial policy. Especially given the daunting nature of the problems, policy makers are to be congratulated on the skill and courage with which they have been pursuing reforms.

II. HISTORY OF HIGHER EDUCATION

19. The policy innovations sketched in the preceding paragraphs can best be understood if they are placed in historical context. Many of Egypt's educational problems have deep historical roots. The ancien regime (roughly, 1840-1952) did little to foster educational development for two reasons. First, the highly inegalitarian system of landownership blocked the wide diffusion of literacy. Economic historical research strongly suggests that there is an inverse correlation between basic education and "plantation societies". Whether in Khedivial Egypt or the post-Reconstruction U.S. South, those with wealth (here, the large landowners) have little or no incentive to agree to tax themselves so that the level of education of "their" agricultural workforce can be raised. By contrast, communities of farm owner-operators are much more likely to tax themselves in order to provide the necessary public infrastructure for wide-spread education. The Egyptian land-tenure system which arose in the 19th century was a major obstacle to the development of human capital. (Richards, 1982; Cochran, 1986; Wright, 1980).

20. The British occupation did little to improve matters. Because of their reliance on methods of indirect rule, the British did nothing to challenge the social dominance of the large landowners and their indifference to mass education. Further, not only did the British reduce spending on education and impose fees for primary education, but they also shaped the educational system to meet their own needs, which were for obedient governmental clerks. Independent, analytical thinking by local functionaries was discouraged by British colonial authorities, who hardly wanted Egyptians challenging or modifying British decisions.[5] Rote-learning and memorization (which fundamentally involves an acceptance of authority) was the educational means to produce

[5] "The less individuality and initiative shown by an Egyptian, the more acceptable he was likely to be to the advisor whose duty it was to train him for the bureaucracy". (Cochran, 1986, p. 13).

such personnel. In addition to retarding the diffusion of literacy (in 1917, after 35 years of British rule, over 90% of the population was illiterate), such policies had two lasting effects: 1) they created values which stressed the importance of education as a means to government employment, and 2) they fostered and reinforced a passive, "memorization" approach to learning. Students advanced by committing large quantities of information to memory, and then repeating it verbatim on examinations. As we shall see, this remains an acute problem in higher education today, nearly a century later.

21. Such stress continued in the early period of Egyptian independence, when, for example, lack of agreement on the combination of traditional and modern subjects to be included in the secondary curriculum was resolved by including both. The large number of subjects which students were expected to master left little choice but to memorize and regurgitate. In 1935, the Ministry of Education issued a report openly criticizing the role of memorization in education; these criticisms are repeated today, including in this report, more than a half-century later.

22. The pace of educational expansion quickened somewhat in the early independence period: at the end of the nineteenth century, about 3.5% of children of primary school age were enrolled, while by 1930, the number had risen to 18%. Although primary schools were made free in 1936 (secondary schools followed in 1950) (Waterbury, 1983), by 1937, less than 15% of the population was literate (less than one-quarter of men and less than 10% of women), with nearly all progress coming between 1917 and 1927.

23. It follows that universities were raised on a very narrow social base. The first University, the Egyptian National University (later Cairo University) was founded in 1908, and became a public institution in 1925. As a private institution it had a liberal arts focus, offering courses on economics, philosophy, history, and Arabic literature. Upon its incorporation into the public sector, it included professional schools, including those of medicine and law. By 1952, there were only two other institutions of higher education in the country, Alexandria University (founded in 1942) and the American University in Cairo, a private institution founded originally by Protestant missionaries. In 1952 Ain Shams university was established; in a pattern often repeated later, this occurred as an "upgrading" of a higher training institute (in this case, for secondary school teachers, and for agricultural and commercial specialists.

24. The fundamental institutions (and problems) of the modern Egyptian educational system were created by the government of Gamal Abd-el-Nasser. His policy innovations were driven by two concerns: 1) a strong commitment to equity and to expanding the social base of education in the country and 2) a desire to bolster Egypt's national independence and regional influence, not only through diplomatic and military means, but also by creating a modern industrial state. Although much was achieved, particularly in contrast with the nearly inert polices of the British and the ancient regime, the goals of neither equity nor growth were fully realized, for two reasons: 1) despite rapid

expansion, the rate of population growth accelerated in Egypt as in all developing countries after World War II and 2) the two goals were often in conflict.

25. Primary education expanded very rapidly, from about one million in 1952 to nearly 3.5 million in 1965/66, or an enrollment growth rate of just under 9% per year. However, despite stated, sincere commitments to universal enrollment, one-third of the eligible age-group was still not enrolled by the latter date. The expansion of other educational sectors was still more rapid: prepatory enrollments increased an astonishing six-fold in 5 years (from 8,000 to 42,000 from 1956 to 1961) and secondary enrollments more than tripled (from 22,000 to 75,000 during the same years). Inevitably, educational quality crumbled before the quantitative flood. Quality fell further because resources were diverted to military activities, and because the government encouraged the export of Egyptian school teachers as a means to enlarge Egypt's influence in the Arab world.

26. The explosion of primary and secondary enrollments set the stage for a huge influx of the "Nasser years cohort" into the higher education system in the late 1960s and 1970s. The rapid expansion reinforced the "quality problem", since only rote memorization was possible in the face of soaring enrollments, tight budgets, and scarce and often inadequately trained teachers. The allocation of resources to education suffered as a result of the heavy demands of military spending and the rapid growth of state-led import-substituting industrialization. This strategy also contributed to the misallocation of resources within the educational sector, in which funding for lower levels lagged behind those of higher education. But such a decision was implicit in the state-led import-substituting strategy, especially when large numbers of foreign technicians left the country during and after the Suez Crisis in 1956. The need to replace such technicians and to expand their numbers fostered a concentration on more advanced levels of higher education at the expense of the primary level.

27. The expansion of the universities was greatly stimulated by the abolition of fees, written into law in 1963. (The large number of non-Egyptian Arab and African students who were encouraged to study in Egypt further increased enrollments). When combined with the "employment guarantee" (see paragraph 2.11), a very strong demand for higher education was thus created: university enrollments rose from just over 50,000 in 1952/53 to over 160,000 in 1969/70. At first, these students were accommodated within the existing universities of Cairo, Alexandria, and Ain Shams Universities. Then "local branches" of existing universities were created, and finally, the local branches became autonomous universities. Although this process began during the Abd-el-Nasser government with the establishment of Asyut University in 1957, it culminated in a wave of university founding in the first half of the 1970s (see paragraph 2.13).

28. The government successfully channelled students into the pure and applied sciences. Whereas between 1910 and 1951 Egyptian universities produced fewer than 5,000 engineers, between 1952 and 1967 nearly 19,000 graduated. By 1971, some 55% of all university students were enrolled in scientific fields. Other prestigious fields such as medicine saw their enrollments expand less

rapidly; nevertheless, between 1952 and 11967 11,400 MDs were graduated. Agriculture, veterinary medicine, and other applied fields also increased their share of total enrollments. (Waterbury, 1983, p. 237).

29. Despite such increased stress on the natural sciences, the numbers enrolled in the humanities rose sharply. The flood of graduates from these faculties contributed to the creation of job guarantee, by far the most difficult legacy of the Nasser period for later educational planners. In 1964 the government promised to employ any university graduate who could not find another job. Acquiring a university degree became tantamount to obtaining a highly secure, if modest, life-time income stream. The private benefits of university education were enormously increased, at the same time as the abolition of fees dramatically lowered the private costs. The demand for higher education, already strongly entrenched for social reasons, shot up.

30. The social benefits, however, were very different. At first, the government placed graduates in both the bureaucracy and in public sector companies. Both became grossly overmanned. By the late 1970s, overstaffing in the public sector companies had spawned such a high degree of inefficiency in production of basic goods that the companies were freed of their requirement to hire new workers. (see. e.g., Hansen and Radwan, 1982, p. 44).[6] In contrast, the government bureaucracy grew rapidly, throughout the 1970s and early 1980s from the already high base created in the 1960s.[7] The job guarantee not only drove a large wedge between private and social returns on higher education, but also seriously segmented the Egyptian labor market (Hansen and Radwan, 1982), contributed to budgetary deficits and macroimbalances, and greatly reduced the efficiency of the public sector. It also hampered the successful upgrading of the quality of higher education.

31. During the 1970s the numerical expansion of university graduates accelerated as the "Nasser years' cohorts" poured into the system in the wake of the expansion of secondary schools: the growth rate of university enrollments rose from 7.6% (1952/53-1965/66), fell to 3.5% (1965/66-1969/70), and then leaped up to 14% per year (1971-1977). To accommodate these numbers, new universities were created at Tanta (1972), Mansoura (1972), Zagazig (1974), Helwan (1975), El-Minya (1976), Minufiyya (1976), and Suez Canal University (1976). However, these universities rarely were equipped with either the physical or human capital necessary to maintain quality. [8] In many cases, faculty live in Cairo, adding difficult commutes to already heavy work-loads.

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[6] Despite the relaxation of the formal requirement for public enterprises to hire labor, public enterprise employment continued to expand: from just under one million in 1976 to 1.2 million in 1986. Public enterprises, like the government bureaucracy and, indeed, all formal enterprises, also faced severe restrictions in firing workers throughout the 1980s.

[7] Government employment expanded form 1.78 million in 1976 to 2.57 million in 1986.

[8] There are notable exceptions to this generalization, such as the Agricultural Economics faculty at Zagazig University, which, under the leadership of Ahmed Goueli, became nearly as prestigious as that of Cairo or Alexandria University.

32. The labor market into which graduates moved was dominated by two developments: large scale emigration of Egyptians to work in the major oil-exporting countries, and the continuing rapid expansion of government employment. The "Dutch Disease" of the period militated against the creation of jobs in traded goods sectors, while government policy continued passively to encourage government employment. The consequences of emigration for the quality of university instruction were not good, since the most skilled and active faculty members could and did find jobs abroad which paid salaries as much as fifteen times those available at home. University administrations were faced with a difficult challenge of maintaining the continuity of their staff and programs in the face of high turnover. The wedge between the social and the private rate of return to a university diploma widened as the marginal social utility of additional public servants declined.

33. In conclusion, Egyptian higher education policy makers have inherited a difficult historical legacy. The quantity of university students has long outstripped their quality; the educational system as a whole has still failed to keep all 6-12 year olds in school; one-half of the adult population is illiterate. Yet, because of the imperatives of structural adjustment, government spending must fall, and funds need to be reallocated within the educational sector. Throughout the 1970s, the problems were recognized, but although there were periodic promises to limit enrollments and to adopt other reforms, nothing of the sort happened. Only in the 1980s have policy makers finally responded to the increasingly severe crisis in the higher educational system.

34. The broad policy response has been very sensible: the government has ceased hiring university graduates, thereby slowly changing the signals to families about the private returns to higher education. It has reduced the total number of students by raising admissions standards, and has raised faculty salaries. Total spending per student has increased, and education receives a higher percentage of the total government budget. There are on-going attempts to raise quality by fostering interdisciplinary programs and by reforming the examination system.

35. These are very wise moves, and have required considerable courage from policy makers. Egyptians had become accustomed to regarding higher education as an "entitlement". The decision was particularly difficult, because, of course, the numbers of eligible students continued to increase, thanks to the on-going expansion of secondary education. In 1971, nearly 79,000 students passed the thanawiyya amma or General Secondary Exam (GSE), the combined secondary school completion/college entrance examination. Ten years later, the numbers had increased to 143,000, a rise of 80%. As one analyst put it in the early 1980s, just before the reforms began to be implemented, "Any major change in the system now would inevitably catch hundreds of thousands of families in midstream and could provoke political resentment similar in its intensity to that following the suspension of some consumer subsidies in January, 1977" (Waterbury, 1983, p. 241). The government took, and takes, considerable risks in reforming the system.

36. As we shall see, however, much remains to be done. Despite the increases in overall spending, the allocation of funds to non-salary spending has fallen, a development which impedes

creating the conditions within which a more analytical, problem-solving and creative approach to learning could be possible. But current policies constitute a courageous reversal of at least twenty-five years of unbridled, ill-conceived university expansion.

III. PERFORMANCE AND ITS DETERMINANTS

Quantities

37. Total university enrollments during the past 15 years are shown in Table 1. Several basic facts are immediately apparent. 1) University enrollments exploded during the period 1971-1977, growing at a compound rate of over 14% per year, with the number of students more than doubling. 2) Growth decelerated during the following seven years, 1977-1984, with enrollments expanding at about 5.4% per year; by 1984 university enrollments were more than three times as large as they had been only 13 years earlier! By the mid-1980s, the number of students was five times larger than the designed capacity of the universities' facilities. 3) 1984 was a water-shed year, in which fundamental policy decisions were taken and began to be implemented: university enrollments have fallen in every year since then, at a compound rate of about -3% per year; by 1989 the total number of university students had been reduced by nearly 100,000, a decline of some 14%.

38. Most of the expansion in university enrollments has been in the humanities: the share of science students in total enrollments fell from over half (55%) in 1971 to just over one-quarter (26.3%) in 1984 (Table 1). This decline in the percentage of science students has not been reversed since the policy reforms of 1984: the decline in enrollments has been roughly equally apportioned between sciences and humanities. Indeed, the percentage of science students in total enrollments actually fell slightly from 1984 to 1989, to 25.3%.

39. Several simple observations may be made on these trends. First, the explosion of enrollments, encouraged by the absence of charges for university admission and by the government job guarantee, had serious implications for the quality of education. This was especially true during the 1970s, when large numbers of faculty members sought, often successfully, to obtain employment in the capital-surplus oil exporting countries. Second, such rapid expansion seriously exacerbated the difficulties of the labor market: the number of graduates rose nearly four-fold between 1973 and 1986 (see Table 2). The fact that an increasing percentage of these graduates were humanities graduates did not improve their job prospects.

40. Part of the response to the situation was the attempt to channel secondary school graduates either into the job market directly, or into two year technical training institutes. These were first established in 1973; enrollments expanded from an initial 20,805 in 1973 to 105,360 in 1989. Unlike university enrollments, these expanded steadily throughout the two decades (see Table

4). Such schools complement the "technical secondary schools", whose enrollments are nearly one million. Graduates from these schools rose steadily, with only a slight dip (1985-86) (see Table 5). Such monotonically increasing enrollments and graduations stand in marked contrast to the situation in the universities, and indicate that at least to some extent, policy makers have been able to "channel" secondary school graduates into these institutes.

41. However, there are important constraints on the demand for such technical education. First, its quality is too often poor, with, as is true throughout the educational system, most resources being absorbed by salaries. These nevertheless remain inadequate, and severe shortages of technical school teachers are reported. This is not surprising: technicians are scarce throughout the economy, and can command good wages, especially in comparison with those offered by the public sector (which includes all technical institutes). But the dis-proportional allocation of resources to salaries has left many institutes ill-equipped, and too often, with equipment and buildings which are poorly maintained. Second, the rapid expansion of the institutes jeopardized quality. Some institutes operate on a two-shift system. Third, the demand for university education is derived not merely from the job market, but also from considerations of status. Graduates of technical schools feel that their education is "second-class", since it does not lead to a bachelor's degree. Fourth, such status considerations also strongly affect the faculty, who, in common with experience elsewhere, [9] seek to upgrade their institution into a university. This has happened twice in Egypt, in which the formerly technical institutes, designed to produce technicians, at Benha and Helwan were upgraded to university status.

42. Real resources available for higher education have continued to expand throughout the period. Table 6 shows the trends. First, after an expansion of the share of higher educational expenditure in GDP from 1.1% to 1.6% from 1980/81 to 1985/86, the percentage has since dropped back to its original share (1.1%) by 1989. However, higher education's share of the government budget has continued to expand during the decade, from 2.5% in 1980/81 to 5.1% in 1989/90. Third, real expenditure per student has increased nearly six-fold. Fourth, this increase has been entirely absorbed by increases in faculty salaries; the share of salaries rose from 55.7% of higher educational expenditure at the beginning of the decade to 69.3% by the close of the decade. Total real non-salary expenditures fell from LE 80 million in 1980/81 to LE 73.1 million in 1989/90; non-salary expenditure per student accordingly fell from about LE 158 to LE 129 (in 1980 LE). The consequences of this development for quality are discussed in the next section.

Quality and Internal Efficiency

43. The key problem with the quality of university education in Egypt is the same as that everywhere: students tend to equate "learning" with "memorizing". Consequently, graduates are ill-

[9] See Clark (1990) for a discussion of a similar phenomenon in the California State University system.

equipped with the habits and skills of problem-solving and synthesis which are the skills needed for the modern world. One cannot "respond to disequilibria" in a creative and socially useful way by repeating memorized materials.

44. Many forces conspire to undermine the quality of higher education and to reduce learning to a process of memorization. It is sometimes argued that modern Egyptian education more closely resembles traditional Quranic kuttab (where boys committed the Quran to memory) than is often appreciated. British policy reinforced this trend (paragraphs 2.2 and 2.3). However, such historical legacies provide only a partial explanation. A more fundamental generator of rote-learning is the paucity of resources at all levels of the educational system. High pupil-student ratios and the dearth of supplementary materials almost guarantee the reduction of education to memorization: how else can a primary school teacher control his or her class of 45 pupils? What can a student be expected to know except what is in the textbook and what the teacher says if these are the only materials available? If tests are structured to reflect this situation at the primary and secondary levels, who could be surprised that students enter the university trained to memorize and regurgitate? Since this is how teachers themselves are trained, who would doubt that they would use the same approach in their own classrooms? If universities themselves have few (and declining) resources other than faculty members (see paragraph 3.7 above), we should find the continued reliance on memorization unsurprising.[10]

45. These "supply side" forces have been reinforced on the demand side: if university graduates have long been bound for the government bureaucracy, where, to put it mildly, the scope for analysis, innovation, and creativity is minimal, why should they learn how to think for themselves? The job guarantee has not only undermined external efficiency of the universities, but has also helped to eviscerate the quality of instruction in the universities.

46. The level of understanding required of many university students to pass exams is low by international standards. (See Box 1). The usual procedure for a student is to buy the lecture notes for a course (typically offered for sale by the professor himself as a way to supplement his income),[11] and to attempt to attend the lectures. One says "attempt", because in some faculties, such as commerce, courses routinely have up to 1,000 students enrolled in a class, and there are usually not enough seats to go around. Student responses include arriving three hours early and "rotation systems", in which groups of friends take turns attending class and then share their notes. The concept of a "syllabus", with readings other than the textbook, is almost unheard of in the Egyptian

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[10] Even students who do have access to alternative materials, and who attend much smaller classes tend to memorize-and-repeat. For example, professors at the A.U.C., with a U.S.-style undergraduate library and class sizes, constantly complain that, as one put it, 'my students respond to tests by 'printing the screen': I 'enter the data', and they 'print it out'!!"

[11] The cost of notes varies with their length; a set of notes for a typical economics class would cost between LE 10 and 20.

university system.[12] This is understandable: how or where would students obtain access to such readings and information? The deficiencies of libraries, fundamentally caused by grossly inadequate budgets, prohibit such assignments.

47. These problems are even worse in the natural sciences and medicine, where adequate training demands "hands-on" activities in labs, dissection rooms, etc. The usual result is a stress on theory at the expense of practice: thus computer students study mathematics, but hardly ever get a chance actually to use a computer, or medical students study anatomy from books, without ever dissecting a cadaver. It is possible that the scientific fields have suffered the most from the deterioration in quality spawned by the decline in non-salary spending per student. This, of course, weakens the country's ability to increase its competitiveness in international markets.

48. Policy makers are acutely aware of these difficulties and are attempting to respond. However, they are constrained in several ways. First, there was little doubt that university salaries had to rise; university professors were not immune from the deep cuts in public sector real wages.[13] Even today, a full professor at Cairo University makes only LE 300 per month, little more than a full-time (perhaps illiterate) maid employed by foreigners. If faculty are inadequately paid, then, of course, the quality of education will suffer dramatically: professors, like most public sector employees, "moon-light" extensively, whether by selling lecture notes or by taking on consulting work. Such activities generate wide-spread absenteeism; it is not uncommon for faculty members to miss at least one-third of the regularly scheduled class meetings. Even under the best of circumstances, the effective academic year rarely exceeds twenty weeks. Although this is technically against the regulations, few administrators can enforce the rules; after all, faculty members have to make a living, and certainly have higher than average expectations and consumption standards. The problem is especially acute for those faculty members who can obtain posts in the Gulf countries. Finally, it is unrealistic to expect anyone to do a job well if he/she is not adequately remunerated.

49. Further, university administrators, including the highest level of the Ministry of Higher Education, have no discretion over the allocation of funds between faculty salaries and other areas of spending. Their budgetary allocations from the Ministry of Finance are "line item" budgets, with funds being non-fungible across categories. Fundamentally, then, the Ministry of Finance is making decisions which directly impact educational quality. It is highly dubious that this ministry has the necessary expertise to make the best educational decisions. Experience elsewhere has amply demonstrated the virtues of greater university autonomy; here, as elsewhere in the economy, excessive centralization of decision making undermines efficiency goals.

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[12] This does not apply to the private American University in Cairo, which attempts to provide a university education conforming to the American model.

[13] Real wages of government employees in the late 1980s were only 55% of those of 1973 (World Bank, 1991).

50. Low salaries and the absence of extra-class materials can interact in a "vicious circle" to undermine quality and to promote rote-learning. Poorly paid faculty members neglect teaching for more remunerative activities. They have little time or resources for research, and too often cannot keep up with developments in their field. They may also sell lecture notes. To maximize the sales of the latter, they structure their tests so that the notes must be memorized. Students respond by buying and memorizing the notes, thus reproducing poorly qualified graduates. They find difficulty finding jobs, which, given the continued de jure job guarantee, increases the pressure on the government to provide for them in some way.

51. The lack of university autonomy and strong centralization also removes the "status competition" which is such a strong motor of change and promoter of quality in the American system. There is only one private university in the country the AUC, [14] which is closely regulated by the government. Proposals to establish additional ones have so far been quashed on equity grounds. This issue is taken up in more detail below (paragraphs 3.37-3.38).

52. In summary, policy makers in the 1980s have inherited a very difficult historical legacy of a university system which provides much higher private than social returns. The resulting overcrowding, low salaries, poor facilities, and lack of alternative materials have all conspired to reduce the educational process far too often to one of rote-memorization. The poorly trained graduates which too often have emerged from this system were for twenty years absorbed into the government bureaucracy, as they were unable to find better employment.

External Efficiency

53. The Egyptian higher education system suffers from serious external inefficiencies. The supply of graduates by the universities and the demand for their services by the job market have long been seriously imbalanced. This disequilibrium was both partially created and temporarily concealed by the government's job guarantee: by undertaking to hire all graduates, open unemployment of graduates was averted. However, such a policy stimulated the demand for higher education, to which the universities responded by expanding enrollments and graduates. This forced the government to hire still more graduates, creating a vicious circle which ultimately became unsustainable for budgetary reasons. Such a policy also had the serious consequence of reinforcing the segmentation of the Egyptian labor market.

54. During the twenty-one year period 1965/66-1986/87 public sector employment increased by 373% (Handoussa, 1988, 31). (See Table 7). The wage bill soared: from 1975 to 1984,

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[14] This year a new francophone university Senghor University was established in Alexandria. This will be quite small, and will draw most of its students from French-speaking African countries. Appropriately, it falls under the authority of the Ministry of Foreign Affairs, rather than that of Higher Education.

wages absorbed an average of 23% of the government's current budget; the numbers shot up to one-third during 1985-1988 (Handoussa, 1988). The consolidated budget deficit, excluding debt payments, reached an unsustainable 23% of GDP in 1986; spending cuts became inevitable. The cuts in the public sector wage bill were magnified by the fact that two budget categories, interest on the public debt and military spending, were sacrosanct.

55. The form of budget cuts had significant implications for graduates and for the long-run demand for higher education. Because the government chose to reduce the real wage bill in the public sector by freezing nominal wages and by imposing a hiring freeze, adjustment was born by real wages and by new labor market entrants. Both affect the demand for higher education: a government job is now worth much less than formerly [15], and such jobs are in any case difficult to obtain.

56. However, several factors reduce the responsiveness of prospective university students to these policy changes. First, the government suspended the "job guarantee" in practice, but not in theory. That is, the government simply ceased hiring people; the last class to be hired was the class of 1984: the "waiting time" has increased from 10 months in 1982 (Sanyal, Nooman, et.al., 1982) to over seven years today. It is likely that lengthening the government job queue in this way has signaled prospective university graduates and their families that a university degree is no longer the route to a secure, if poorly paying, job.

57. The message would have been much clearer, however, if the government had simply abolished the guarantee. By leaving it on the books, the government remains responsible for the employment of graduates. This may lead to various employment schemes of dubious value, such as the plan to distribute reclaimed agricultural land to graduates. The government is now distributing more than 150,000 feddans [16] of reclaimed land in the West Nubariyya area (West of the Delta) to some 167,000 graduates, of whom roughly 70% have earned their degrees in non-agricultural disciplines. (FAO, 1989) Giving such graduates 6 feddans of fragile soil in an environment requiring considerable skills and high-technology (e.g., drip irrigation) may threaten the approximately LE 6,000 per feddan which the GOE has invested in land reclamation. This example illustrates the continuing inefficiencies created by maintaining government responsibility for the employment of university graduates.[17]

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[15] Indeed, "the average income level of a federal employee is only marginally above the absolute poverty line...for the urban sector." (World Bank, 1990a, p. 43).

[16] 1 feddan = 1.038 acres = .42 hectares

[17] In early May, 1991, there were (unconfirmed) rumors in Cairo that the government intended to abolish the de jure guarantee as part of the reforms in the government's Letter of Intent to the I.M.F. Such rumors are encouraging, for if nothing else, they show that the government is at least seriously considering making such a decision.

58. The existence of the de jure job guarantee also seriously biases unemployment statistics in Egypt. Unemployed persons are those who register as such with the Ministry of Labor; in effect, they are "queueing" for government employment. They must re-register every twelve months, and must assert that they have no other job. Since the country has no system of unemployment insurance, such individuals subsist either on the largesse of relatives or from earnings in the informal sector. Gunnar Myrdahl's telling remark, "Unemployment is a bourgeois luxury" certainly applies to Egypt.

59. Nevertheless, the problem of graduate unemployment certainly poses a challenge for the government. Despite reforms, the surplus of graduates continues to burden the labor market. Trends in the composition of unemployment are shown in Table 8. The absolute number of unemployed university graduates has exploded, rising from 5,405 in 1960 to 56,693 in 1976 to 236,530 in 1986.

60. The surpluses are not confined to humanities graduates, whose numbers grew most rapidly. Engineering graduates from the public universities, for example, often require four years to find a satisfactory job. This is in contrast to the (small) number of engineering graduates from AUC, who seem to have few difficulties finding employment. The difference may be explained by the English language facility and greater non-classroom materials available to students at the AUC. However, even they have some difficulties finding the type of job which they would like. This appears to be because many engineering firms need not so much university engineers, whose training is primarily in design (whether of bridges, computers, chemical processes, etc.) but rather technicians who can implement and maintain already existing designs. Quite a few engineering graduates find themselves employed as technicians.

61. It has been said that Egypt's most critical labor shortages are for the "sergeants of industry"--the technicians and supervisory personnel who are so essential to the smooth functioning of modern industry. Private sector formal sector firms also frequently complain of the paucity of satisfactory "middle management" personnel. Technical institutes have attempted to fill this gap, but so far, they have had mixed success. (See paragraph 3.4) Employers tend to prefer the graduates of the mixed secondary/post-secondary "five year" technical institutes. Not only do the students in the latter usually receive more practical training than those in the two year institutes,[18] but they also seem to have a better attitude toward technical work than their counterparts from the two-year institutes.

62. Another problem is that technical training needs to be general rather than excessively specific. This is not only because technology and consumer tastes can change swiftly, but also because the current structure of Egyptian industry has little to do with the country's comparative advantage

[18] Five-year students receive about 1750 hours of practical training, compared with about 1200 for two-year students

as revealed, for example, by domestic resource cost calculations (UNIDO, 1986[19]. It would do little good, for example, to expand the supply of technicians careful trained in the details of aluminum production, when the economic rate of return on this industry is -20% (compared to a financial rate of return of +12%). The stress at all levels of education should be on developing problem-solving ability, not on developing excessively specialized skills.

63. In the final analysis, however, the mismatch between the labor market and the higher education system is the result of non-educational labor market policies. The failure of adequate job creation in the Egyptian economy is fundamentally the fault of the capital-intensity bias of policy and the failure of growth, in turn caused by the accumulation of debt, by the excessive reliance on petroleum and remittances, and by macroimbalances and microdistortions.

Equity

64. The fundamental equity problem of the higher educational system is a common one: the inequitably (and probably also inefficiently) excessive allocation of public funds to higher education at the expense of lower levels. This problem was especially acute during the 1970s: while university enrollments exploded, the school participation rate for children between the ages of 6 and 11 remained approximately stationary at just over 68%. (The rate actually fell for boys during the decade, from 81.6% in 1970/71 to 77.8% in 1980/81). The situation improved during the 1980s. The increased real resources allocated to primary education during the 1980s probably has increased the overall equity of the educational system. It is noteworthy that the absolute number of unenrolled primary school children decisively declined during the 1980s; the decline was especially notable for girls, falling by roughly one-third.

65. However, a comparison of the budgets of the Ministries of Higher Education and of Education show a rather different picture (see Table 9). If one assumes that the sum of the two Ministries' budgets is a reasonable proxy for "educational spending", then the share of higher education in the total is approximately one-third; an alternative analysis, combining official data with cohort analysis, suggests that the 10% of the cohort of 1970 in higher education received 50% of all educational expenditure. It is disturbing to note that, if anything, the share of total educational expenditure (defined as the sum of the two Ministries' budgets) allocated to higher education has increased during the 1980s.

66. The reason why such allocations are inequitable is the usual one: university students rarely come from the lowest income -brackets. As is true world-wide,the subsidy to higher education is a subsidy for the middle-class. An analysis of the educational cohort of 1970 showed that those in

[19] Domestic resource cost calculations measure comparative advantage by comparing the DRC ratio (the ratio of value-added to non-traded inputs) to the (shadow) exchange rate.

the "upper income" group (8% of the cohort's population) received 14% of all educational expenditure, "middle income" group (67% of the population) received 74% of expenditure, while the poor (25% of population) received only 12% of expenditure. Education in Egypt, as elsewhere, subsidizes the middle and upper classes.

67. It is difficult to determine the rural-urban equity aspects of higher education, since no data are available on the geographical origin of university students. However, some indirect information may be obtained by looking at the enrollment ratios at the secondary level; there is a marked "urban bias" in such ratios: 61.2% of urban youth of this age are so enrolled, while only 25% or rural youth are enrolled. Since agriculture, the main rural economic activity, is taxed (Dethier, 1989), subsidies to higher education may be construed as a transfer from rural to urban areas, and hence, as disequalizing.[20]

68. Within higher education itself, a principal equity issue is the gender question. Here some progress appears to have been made during the 1980s. Although women are still a minority of university students, they are slightly better represented now than in the mid-1970s. (See Table 10) Women now constitute over a third of all university students; although the absolute numbers of women students declined along with total enrollments after 1985, they declined proportionally less than the numbers of men.

69. An important equity (and efficiency) issue has been raised in Egypt as elsewhere concerning charging "user fees" for higher education. Given the generally higher socio-economic status of most university students, such a change would be desireable. Indeed, the current structure of fees (charged for primary, but not for higher education) is precisely the opposite of what a genuine concern for equity would dictate. The problem of change is, as usual, political. Middle-class people are everywhere more vocal and politically active than the poor. Since many of the "middle class" people who enjoy university subsidies are far from wealthy, they feel very threatened by the prospect of university fees.

70. This question is linked to another issue which has been publicly discussed but upon which no action has been taken or is even seriously contemplated: the creation of private universities. As previously noted, one such institution already exists: the American University in Cairo. Despite receiving grants and funds from the United States, tuition is high: some US$5,000 per semester, equivalent to tuition at less-expensive private universities in the United States. Such fees are far above the means of the vast majority of Egyptian families. However, enrollments in the AUC have grown rapidly, and demand for entrance is strong. It is conceivable that other private universities, charging lower fees than the AUC but more than the public universities, might be able to attract students and to be self-financing.

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[20] Average urban incomes are about 46% above rural averages. (World Bank, 1991, p. 11).

71. The advantages and disadvantages of such a policy initiative are well-known. On the one hand, such institutions could take some of the pressure off of the public universities and could offer, presumably, higher quality education through higher faculty salaries, smaller class sizes, and greater provision of library, laboratory and other "extra-classroom" materials. However, there is considerable fear in Egypt that this might create a "two-tiered" educational system, in which the private schools offered superior education to the well-to-do, leaving the poorer students with an inferior education.

72. Such fears are likely misplaced. Such a dual system already exists. In general, the current educational system is inequitable because it is (relatively) biased against primary education. More specifically, a "two-tiered" system already exists at the secondary level: wealthier parents send their children to private schools, especially those offering instruction in foreign languages (English, French, German). Finally, the "tutorial system", prevalent at both the secondary and also at the university level, gives an additional advantage to families with greater resources. The hiring of private tutors greatly improves the chances of a student's receiving a high mark on the General Secondary Exam, and therefore, of his or her access not only to the university, but also to the more prestigious faculties such as medicine. Private tutoring continues at the university level; the practice seems to have begun in medical schools, and then to have spread to other disciplines. The outcome is the same as at the secondary level: those who can pay receive superior instruction and achieve better results. Consequently, and in common with most countries, the current structure of education, while offering some important avenues for social upward mobility, by and large reproduces the existing class structure. Little would be lost by explicit recognition of this fact.

73. In summary, reforming the system of higher education subsidies is essentially one of finding an appropriate targeting mechanism. The most common such system world-wide is a combination of fees with scholarships for the needy. A difficulty in Egypt is that the popular perception of government competence is unflattering. It is widely assumed that any scholarship system would in practice reward the well-connected, rather than the talented-but-poor. Accordingly, many believe that a system of "targeting" in higher education would indeed exclude the less well-off, however able and motivated they might be. The problem of increasing the equity of higher education cannot be divorced from the political problem of the public's negative perception of governmental administrative capacity.

Summary: Determinants of Performance

74. The determinants of the performance of the higher educational system may be summarized in a supply-and-demand framework, with due attention given to the impact of policy on both aspects of the market. On the supply side, the fundamental problem is one of quality: university students too rarely are trained to analyze, synthesize, and solve problems. Instead, they learn to memorize and regurgitate lecture notes. Needless to say, such graduates have not been

taught to "respond rapidly to disequilibria". The causes of such a supply problem are: 1) very large class sizes, 2) low faculty salaries, which encourage absenteeism and the selling of lecture notes to supplement income, and above all, 3) the inadequacy of non-class materials (libraries, assigned readings, laboratories, computers, etc.) which are indispensable if students are to learn analytical thinking.

75. Such problems reflect the paucity of resources in the higher education system. This, in turn, is policy generated. Since education is free, all resources must come from the government budget. Since the budget is chronically and catastrophically in deficit, there is great pressure to reduce spending. Creditably, Egypt has avoided reducing real resources allocated to education. However, the decline in the allocation of real resources to non-salary items blocks any program to improve quality.

76. The absence of fees also greatly increases the demand for higher education. Students attend the university hoping to improve their life-time earnings; this has been strongly reinforced by the government job guarantee. Implementing this policy, combined with the absence of fees, greatly increased the private return to higher education. Although the government has not hired new graduates for over six years, the fact that the guarantee has not been explicitly and legally repudiated continues to send socially wasteful signals to prospective university students and their families. The government's program to grant reclaimed land to graduates is likely to reinforce such signals.

77. Government policy has very likely succeeded in reducing the private rate of return to education, not only by lengthening the waiting time for a government job (or allocation of land), but also by reducing real wages in the bureaucracy. Yet despite such falls, university enrollments exploded in the 1970s; the decline of the late 1980s was not the result of slackening demand, but was caused by government-mandated enrollment limitations. The demand for higher education in Egypt seems quite inelastic with respect to either the availability or the remuneration of government employment.

78. There are at least two reasons for such demand inelasticity. First, demand for higher education may be counter-cyclical: if it is difficult to find work which is congruent with the job seeker's aspirations, then staying in school is a reasonable strategy, particularly given its low cost. Although government wages declined more rapidly than those elsewhere in the economy, real wages in the last five years have declined throughout the economy and quality jobs are increasingly scarce. The continued strong demand for higher education may be very much a response to the poor labor-market prospects of most graduates.

79. A second source of the inelasticity of demand for college education with respect to real wages in government (or indeed elsewhere) is that the derived demand for university education is based not only on the job market but also on the "marriage market". White-collar work has great prestige in Egypt; manual labor has a distinctly lower status. Accordingly, families are reluctant to

marry their daughters to men who work with their hands. The "effendi syndrome", democratized under Abd-el-Nasser, reduces the responsiveness of the demand for higher education to labor market signals. One would expect such norms to change over time; there is already some anecdotal evidence that, at least among the lower middle-class, the higher earnings of private sector skilled workers (e.g., plumbers, electricians) relative to government employees has increased the attractiveness of the former in the marriage market. Such social norms, however, change only slowly, and contribute to the very strong demand for higher education.

IV. CONCLUSION: RESPONSES AND REFORMS

The Government

80. Government policy strongly shapes both the demand and supply sides of the higher education market. Policies may be divided into the direct and indirect: the former are explicit "higher education policies", while the latter include government budgetary decisions and, especially, labor market and employment regulations. In general, far more change has occurred with the former than with the latter.

81. The government responded to the unsustainable rate of growth in higher educational enrollments by restricting entrance; this was done by raising the scores required to pass the GSE or thanawiyya al-amma. The reduction in the number of students was combined with an increase in total real resources to higher education. These, however have been spent almost entirely on raising salaries; such a decision was taken by the Ministry of Finance, which makes "line item" allocations to the Ministry of Higher Education. It was certainly necessary to raise salaries; even now, they are far too low to promote quality instruction. But the paucity of non-salary resources seriously impedes upgrading the quality of instruction and training. Nevertheless, the increase in real resources per student is certainly a step in the right direction. It is also notable that this was achieved under increasingly severe governmental budgetary constraints.

82. The government's de facto suspension of the government job guarantee is also helpful. Arguably, it is inadequate. Its de jure existence continues to send the wrong signals to prospective students and creates considerable pressure on the government to provide alternative employment for graduates. Thus, rather than simply recognizing and publicizing the fact that the government cannot remain responsible for providing jobs for graduates, the GOE tries to provide jobs for them by using some of its resources from outside of the bureaucracy. Schemes such as the distribution of reclaimed land to graduates continues to signal prospective university students that "the government will provide" if you have a degree. It would be far better simply to cancel the guarantee outright.

83. Changes in government policy have not had a perceptible impact on increasing the equity of the educational system as a whole. The fundamental weakness remains the disproportionate allocation of resources to higher education at the expense of primary education. It is not unnecessary to assume, of course,that funds for one need come at the expense of the other; there are many other budgetary allocations (particularly, those covering the losses of state-owned enterprises) which could be cut to free resources for greater human capital investment. However, if a fixed budget for all educational expenditures is assumed, the current allocation is not only inequitable, but also inefficient: primary schooling has a far higher social rate of return than does higher education, while the "quality problems" encountered in the university are partly created by deficiencies in pre-tertiary education.

84. The Achilles Heel of government policy toward higher education is the many impediments to job creation. The list of Egyptian "anti-employment policies" is long and familiar: overvalued real exchange rates, negative real interest rates (both partially caused by huge government deficits), very low energy prices, output price distortions, and a regulatory environment which not only impedes the growth of private traded goods production but also turn labor into a fixed cost. The rate of change in these policies is very slow; with a labor force growing at 2.7% per year, the problems of university students' finding jobs will only become increasingly severe, despite restrictions on enrollments.

Employers

85. Private sector employers have relatively few direct links to the universities. Legally, the government has a monopoly on all job placements. In practice, some limited private sector placement is tolerated; there are occasional "job fairs" (e.g., at A.U.C.) and a few private sector job placement services operate near Cairo University. Formal private sector companies also maintain informal networks of personnel managers, who share information on needs, salaries, etc. Such groups as, for example, the Overseas Security Advisory Council, largely composed of foreign firms, share such information. The informal sector, of course, requires few services of university graduates as such; many graduates are employed in this sector, since they cannot find alternative employment. Recruitment here is through personal ties, word-of-mouth, etc. In short, formal and even informal linkages between private sector hiring and the universities are very limited.

Students

86. Students seem to have responded sluggishly to the new conditions. More students are attending technical schools, but this may simply be the result of the lack of alternatives given the increasing restrictiveness of university admission policies. There is little evidence that the demand

for higher education has slackened significantly; the very slow change in "marriage market" conditions offers a plausible explanation for this phenomenon.

Universities

87. Despite the low level of autonomy of decision making power of university administrators, a number of innovative responses are observable. Responses here include the attempt to upgrade textbooks, to increase reliance on "self-teaching" materials, and to develop a few innovative programs which stress greater student initiative, problem-solving, and practicality (See Box 2). It is planned to separate the college entrance examination from the secondary school completion exam, and to change the content of the exam. It is already possible to substitute the U.K.'s A-level examination for the GSE. Officials at both the universities and the Supreme Council would like to increase the allocation of resources to non-salary areas, but they are tightly constrained by the budget given them by the Ministry of Finance.

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TABLE 1: HIGHER EDUCATIONAL ENROLLMENTS

YEAR	NUMBER OF STUDENTS ENROLLED	% SCIENCE* STUDENTS
1971	191,483	55.0%
1972	213,370	52.8
1973	254,537	48.7
1974	301,325	45.7
1975	348,984	43.7
1976	418,932	41.4
1977	452,027	39.7
1978	473,426	39.1
1979	482,334	37.6
1980	505,081	36.2
1981	555,970	33.3
1982	598,251	29.4
1983	643,034	26.9
1984	660,357	26.3
1985	649,140	25.8
1986	636,684	25.7
1987	609,500	26.5
1988	585,447	25.9
1989	567,682	25.3

*" Science students" defined as enrolled in the Faculties of: Natural Sciences, Medicine and Pharmacology, Nursing, Engineering, Agriculture, Veterinary Medicine, Technology, Electronics, Physical Training, Applied Arts, Cotton Science, Petroleum and Mining, and Construction Planning.

Source: CAPMAS.

TABLE 2: HIGHER EDUCATION GRADUATES

YEAR	HUMANITIES	SCIENCES	TOTAL
1973	14,859	15,587	32,401
1974	19,672	17,029	39,194
1975	23,532	17,542	44,407
1976	28,425	19,522	51,927
1977	37,002	20,875	62,329
1978	39,268	23,502	65,632
1979	43,223	25,327	72,389
1980	43,239	26,324	73,848
1981	47,111	29,166	77,989
1982	52,966	30,609	82,796
1983	56,874	30,878	87,540
1984	70,500	29,830	100,305
1985	80,582	30,666	111,281
1986	82,889	29,805	113,070
1987	78,580	30,699	107,254
1988	75,032	30,181	103,369
1989	70,004	28,674	95,734

Source: CAPMAS

TABLE 3: NUMBER OF STUDENTS PASSING THE GENERAL SECONDARY EXAM

YEAR	SCIENCE	MATH	ARTS	TOTAL
1971	56,485	----	22,376	78,861
1972	64,544	----	29,444	93,988
1973	74,564	----	33,093	107,657
1974	87,340	----	36,918	124,258
1975	83,759	----	38,290	122,049
1976	73,719	----	33,360	107,079
1977	61,378	17,995	38,360	121,482
1978	56,680	22,769	39,101	118,550
1979	55,493	27,362	46,010	128,865
1980	57,579	34,401	51,402	143,382
1981	54,777	34,277	53,930	142,984
1982	53,250	36,920	53,380	143,550
1983	54,731	38,801	54,115	147,647
1984	55,850	36,629	64,312	156,791
1985	56,386	36,771	64,123	157,280
1986	71,340	45,050	71,199	187,589
1987	52,545	34,541	59,008	146,094
1988	54,317	29,718	63,146	147,181
1989	45,662	22,460	65,873	133,995

Source: CAPMAS

TABLE 4: TECHNICAL SCHOOL ENROLLMENTS

YEAR	STUDENTS ENROLLED
1973	20,805
1974	25,029
1975	27,212
1976	28,829
1977	31,541
1978	36,475
1979	39,802
1980	44,722
1981	52,283
1982	55,782
1983	59,423
1984	65,256
1985	85,630
1986	101,394
1987	102,793
1988	104,812
1989	105,360

Source: CAPMAS

TABLE 5: GRADUATES FROM TECHNICAL INSTITUTES

YEAR	NUMBER OF GRADUATES
1972	4,902
1973	5,009
1974	6,998
1975	6,890
1976	6,935
1977	7,855
1978	8,863
1979	11,469
1980	11,392
1981	14,209
1982	16,836
1983	17,027
1984	18,894
1985	20,293
1986	26,993
1987	32,541
1988	35,036
1989	35,335

Source: CAPMAS

TABLE 6: SPENDING ON HIGHER EDUCATION

YEAR	REAL SPENDING PER STUDENT*	%SALARIES	%OTHER**
1980/81	331.06	55.7%	40.54
1981/82	405.34	59.04	37.29
1982/83	467.87	62.52	33.75
1983/84	573.45	61.63	35.38
1984/85	735.63	64.40	32.22
1985/86	834.23	64.94	29.32
1986/87	1038.16	66.97	24.76
1987/88	1436.04	67.44	24.57
1988/89	1684.98	72.30	22.91
1989/90	1951.36	69.30	22.29

Source: World Bank, 1990b.

*1980 LE
**Subsidies and Supplies

TABLE 7: GOVERNMENT* EMPLOYMENT

YEAR	INDEX	NUMBERS OF EMPLOYEES
1960	72	670,000
1966	100	933,000
1967	111	1,034,000
1968	118	1,103,000
1969	122	1,135,000
1970	127	1,188,000
1971	134	1,250,000
1972	138	1,291,000
1973	158	1,471,000
1974	178	1,661,000
1975	182	1,701,000
1976	191	1,779,000
1977	205	1,911,000
1978	221	2,065,000
1979	238	2,216,000
1980/81	265	2,474,000
1981/82	283	2,645,000
1982/83	306	2,850,000
1983/84	323	3,015,000
1984/85	344	3,205,000
1985/86	360	3,329,000
1986/87	373	3,480,000

Source: Handoussa (1988), p. 31.

*General government plus economic enterprises.

TABLE 8: EDUCATIONAL CHARACTERISTICS OF THE UNEMPLOYED

EDUCATIONAL LEVEL	YEAR		
	1960	1976	1986
Illiterate	45.8%	23.6%	3.0%
Literate	29.7	11.0	22.0
Primary and Less than Secondary	3.4	7.9	3.0
Intermediate and Less than University	17.4	35.0	57.0
(Over Secondary)	(n.a.)	(n.a.)	(5.0)
(Secondary)	(n.a.)	(n.a.)	(52.0)
University	3.2	9.6	16.0
Unspecified	0.4	12.9	0

Sources: 1960, 1976: Osman and Sobhi (1989), p. 193;
1986: World Bank (1990b), p. 51.

TABLE 9: SHARE OF HIGHER EDUCATION SPENDING IN TOTAL EDUCATIONAL SPENDING

YEAR	HIGHER EDUCATION'S SHARE*
1980/81	32.9%
1981/82	31.1
1982/83	33.6
1983/84	35.1
1984/85	37.7
1985/86	35.8
1986/87	34.8
1987/88	36.0
1988/89	35.6
1989/90	36.7

Source: World Bank (1990b).
*Share= Budget of MOHE as percentage of combined budgets of MOHE and the Ministry of Education

TABLE 10: FEMALE ENROLLMENT IN UNIVERSITIES

YEAR	NUMBER OF WOMEN ENROLLED	% OF ALL STUDENTS
1976	124,934	29.8
1977	136,178	30.1
1978	141,835	30.0
1979	149,077	30.9
1980	158.036	31.3
1981	181,580	32.7
1982	195,409	32.7
1983	205,633	32.0
1984	215,079	32.6
1985	215,754	33.2
1986	215,129	33.8
1987	209,875	34.4
1988	203,068	34.7
1989	198,202	34.9

Source: CAPMAS

BOX 1: UNIVERSITY EXAMS: THE CASES OF ECONOMICS AND GEOLOGY

Egyptian university students often simply memorize and repeat the basic principles of a field of inquiry which they have learned in lectures and/or from a textbook. Far too seldom are they challenged to apply what they have learned to a simulated "real world" situation or problem. The fact that the only measure of students' performance is one, end-of-the-year exam is also deleterious to developing the kind of problem-solving skills which the country requires: problem-solving is a day-in, day-out practice, not a once-for-all exercise. It is a state of mind, not a once-a-year experience.

For example, consider the following exam, for first year economics students at Cairo University in 1989.

EXAM

Part I
Answer the Following:

Explain, by drawing if possible, the difference between:

1) the marginal propensity to save and the average propensity to consume;

2) the change in demand and the change in the quantity demanded;

3) economic growth and economic stagnation;

4) absolute inequality and absolute equality in the distribution of income.

Part II
Answer only two of the following:

1) Define the consumer's equilibrium for two commodities, x and y. What is the equilibrium condition? What effect does an increase in the price of commodity x have on that equilibrium?

2) Explain--by drawing--the effect that autonomous investment has if added to the total demand on the equilibrium level of national income. And explain the effect that such investment has on savings after the new equlibrium.

3) Suppose that two substitutes (rice and macaroni) are in equilibrium. Explain the effect of an increase in the subsidy for the production of rice has on both the price and quantity of rice and macaroni.

This is a three-hour exam, in Arabic, and constitutes the only measure of a student's performance after one whole year of concentrated study of economics. However, these question do little more than ask for basic definitions, or for the most rudimentary application of fundamental economic principles. Question II-1, for example, might appear as one question on a mid-term exam during the first semester in an American university; such a question would be only a small fraction of a typical microeconomics midterm, requiring perhaps five minutes to answer. The "meat" of the

exam would consist of considerably more complicated problems. An American student would also not typically be studying only economics at this stage of his/her academic career; nevertheless, the testing to which he/she would be subjected would be far more difficult.

These problems of testing simply reflect (and reproduce) the problems of quality discussed in the text: lack of alternative materials, previous training of students (and faculty), custom, large class sizes, etc. They are found in many other fields and universities as well. Indeed, Cairo University is the oldest and most prestigious of the universities; its economics faculty contains several world-class scholars; obtaining admission to this faculty is difficult. If this prestigious and highly competent faculty has such a problem, the situation is very likely to be even worse elsewhere in the higher education system.

Much the same can be said of other disciplines. For example, consider the case of the following 1 1/2 hour final exam in Ore Minerology (for a fourth-year student of geology at Cairo University, May, 1988).

"Answer 2 questions only from the following (illustrate your answers):

1. Draw the TiO2, FeO, Fe2O3 triangle to show the possible continuous and discontinuous solid solutions referring to one of each in detail and giving examples from Egypt.

2. Discuss four of the following:
   a. Modern and classical methods of polishing;
   b. polishing hardness and microhardness (VHN);
   c. Reflection and bi-reflexion;
   d. Microchemical and etching tests;
   e. Apllications of ore-microsropy in mineral technology.

3. Compare and contrast between four of the following pairs:
   a. Replacement and ex-solution textures;
   b. Colloform textures and crustification bonding;
   c. Relict and caries textures;
   d. deformation bonding and translation twinning;
   e. internal reflections and anisotropism."

This author has no expertise whatsoever in geology; nevertheless, to his naive eye, this exam, like the one in economics, fails to test the student's ability to apply knowledge to problems. Instead, he/she is asked to very general questions, which largely test whether the student has memorized the lecture notes.

BOX 2: SOME INNOVATIVE RESPONSES TO THE QUALITY PROBLEM

There now exist several innovative, interdisciplinary programs at several Egyptian universities. These programs are specifically designed to increase the "external efficiency" of university training by being more practically oriented than the usual program. In particular, the stress is on solving real world problems; since such problems often have dimensions which transcend academic disciplinary boundaries, students are encouraged to take some courses in related areas. (This is similar to the concept of a "minor" in American universities; the concept does not exist in Egyptian universities). Further, since some basic principles may apply to more than one field, students with different areas of concentration come together in one classroom. It is hoped that this will increase their interaction, and also further promote a stress on application of principles.

For example the Insttitute of Graduate Studies and Research at Alexandria University has instituted four interdisciplinary, post-graduate programs. Faculty and students remain in their respective departments, but come together in certain "group" classes and activities. The groupings are:

1) materials--which includes faculty and students from physics, chemistry, engineering, dentistry, and orthopedics;

2) environmental studies--with participants from science, engineering, economics, administration, and law;

3) bioscience and technology;

4) information studies.

The program at present has about 150 students. Success stories include architects who, through participation in program #2, have become qualified city planners, and geology graduates who, by a pursuing a course of study in information studies, have become adept at computer applications in geology.

An early version of such an approach to higher education was pioneered by the Cairo University Faculty of Agriculture at the Fayoum Campus. Students from various disciplines are brought together, and trained through seven "course modules", which stress the mastery through application of fundamental agricultural principles. Students are tested not merely at desks, but also in labs and in the field. New materials such as work-books, video-tapes, slides and other visual aids are utilized. Such a case illustrates the fundamental argument of the text that extra-classrooom resources are essential to the development of such a "hands-on" method of teaching, which, in turn, develops the kind of problem-solving ability which the country needs.

The Faculty of Economics and Political Science at Cairo University have recently made a joint proposal (with the Department of the same name at the American University in Cairo) for a master's degree program in public policy analysis (including diplomacy and management). Like the other programs, this one aims to draw on different disciplines and to be closely linked with practical experience and field-work.

Finally, the Faculty of Medicine at Suez University has been able to overcome the usual problem in Egyptian medical training of the lack of clinical experience. This has been achieved by a drastic limitation on the number of students admitted, and by a substantial augmentation of resources, provided to the university by the local governorate. The success of this program illustrates the argument of the text: greater non-faculty resources per student are essential if quality is to be raised. Students not only receive more faculty attention, more clinical training, but also go abroad for three years of training, which is sponsored by Suez University. The model of developing links with overseas institutions (here, teaching hospitals) could be profitably emulated by other innovative programs.

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